THE department of vertebrate palæontology of the American Museum of Natural History reports that in 1898 the second expedition for Dinosaurs was sent out to Wyoming in charge of Dr. J. L. Wortman, with a party of four. Deposits of Dinosaur bones very favourably situated were found. In all some 60,000 pounds of fossils were secured. This splendid collection reached the museum entirely uninjured, and one-third of it has already been worked out. The fore and hind limbs of these monster reptiles will furnish subjects of great interest for the public. The exhibition hall has been enriched by the skeletons of two great Dinosaurs. A second party, under the direction of Dr. W. D. Matthew, was at work in 1898 in the fossil beds of north-western Kansas and south-western Nebraska. The Bad Lands of north-eastern Colorado were also found to be a rich collecting-ground. Skulls and parts of skeletons were secured, filling many important gaps in the Museum collection. Portions of skeletons and skulls of fossil camels were found, among which is included a gigantic one of the size and proportions of the giraffe. The party also acquired a large amount of other material. It is a little surprising to notice that, though the museum is doing so much to promote educational and scientific advancement in New York, the income in 1898 was insufficient to meet current expenses.

THE monograph, "The Later Extinct Floras of the United States," left unfinished by the death of Prof. Newberry, is to be completed by Dr. Arthur Hollick.

THE Essex Technical Instruction Committee have issued, through the County Technical Laboratories, Chelmsford, a report, compiled by Mr. T. S. Dymond, of a visit paid to Holland by Essex agriculturists in May and June of the present year. The report is interesting reading, and gives a brief outline of the more prominent features of Dutch farming. A perusal of the pamphlet will supply English agriculturists with a few hints which in some cases might with advantage be acted upon in this country.

THE report of the Connecticut Agricultural Experiment Station for 1898 has just been published, and is full of valuable matter. Several of the reports contained in the volume should be of interest and service, not only to inhabitants of the State of Connecticut, but to many others.

A SERIES of illustrated articles on "Radiography," by Mr. James Quick, is begun in the October number of *Science Gossip*. The same issue also contains the continuation of articles on "British Freshwater Mites" and "Butterflies of the Palæarctic Region," and numerous other contributions of popular science.

THE Royal Technical Institute, Salford, has issued its calendar for the session 1899-1900. The list of classes is a large one, and, judging from the illustrations of laboratories, workshops, &c., given, the institute is equipped in a very efficient manner.

THE additions to the Zoological Society's Gardens during the past week include a Smooth-headed Capuchin (*Cebus monachus*) from South-east Brazil, presented by Mr. M. P. Peeker; a Chopi Starling (*Aphobus chopi*) from Brazil, presented by Mr. W. R. Routledge; two Orange-flanked Parrakeets (*Brotogerys pyrrhopterus*) from Western Ecuador, presented by Mr. W. H. St. Quintin; three Palm Squirrels (*Sciurus palmarum*) from India, presented by Mrs. M. E. Tracy; a Brown Capuchin (*Cebus fatuellus*) from Guiana, a Guinea Baboon (*Cynocephalus sphinx*) from Africa, a Striped Snake (*Tropidonotus ordinatus sirtalis*) from North America, three Common Snakes (*Tropidonotus natrix*), a Four-lined Snake (*Coluber quatuorlineatus*), a Tessellated Snake (*Tropidonotus tessellatus*), a Smooth Snake (*Coronella austriaca*), a Glass Snake (*Ophiosaurus apus*), an Eyed Lizard (*Lacerta ocellata*), six Slowworms (*Anguis fragilis*), European, deposited; two Baillon's Aracaris (*Andigena bailloni*) from Brazil, a White-browed Amazon (*Chrysotis albifrons*) from Honduras, twelve Dwarf Chameleons (*Chamaeleon pumilus*) from South Africa, purchased; a Wapiti Deer (*Cervus canadensis*), an Axis Deer (*Cervus axis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET GIACOBINI (1899 E).—We have received the following elements and ephemeris (calculated by Herr J. Moller) from the Centralstelle at Kiel.

Elements.

T = 1899 Aug. 26·707. Berlin Mean Time.

$$\left.\begin{aligned}\omega &= 358^\circ\ 46'\cdot1\\ \Omega &= 273\ \ 26\cdot9\\ i &= 79\ \ 53\cdot5\end{aligned}\right\}1899\cdot0$$

$$\log q = 0\cdot23796$$

Ephemeris for 12h. Berlin Mean Time.

1899.			R.A.			Decl.			Br.
			h. m. s.			° ′			
Oct.	5	...	16 36 59		...	−3 18·7		...	0·93
	7	...	39 50		...	2 41·4			
	9	...	42 42		...	2 5·1		...	0·86
	11	...	45 34		...	1 29·5			
	13	...	48 27		...	0 54·6		...	0·81
	15	...	51 20		...	−0 20·3			
	17	...	54 14		...	+0 13·3		...	0·76
	19	...	16 57 8		...	+0 46·4			

HOLMES' COMET (1899 *d*).—M. H. J. Zwiers gives in *Ast. Nach.* (Bd. 150, No. 3595) an extended ephemeris of this comet, in the hope that it may still be observed by any one having the necessary optical power, and thus permit of a more exact determination of this orbit.

1899.		R.A.	Decl.	Br.	
		h. m. s.	° ′ ″	$(r)^{-2}$	$(r\Delta)^{-2}$
Oct.	12	2 59 45·75	+48 10 16·1		
	13	58 53·29	16 57·5		
	14	57 58·94	23 18·9		
	15	57 2·77	29 19·7	0·1647	0·05900
	16	56 4·85	34 59·8		
	17	55 5·26	40 18·7		
	18	54 4·07	45 16·1		
	19	2 53 1·35	+48 49 51·7		

THE ROTATION OF THE SUN.—In a publication issued from the Lund Observatory, Herr C. A. Schultz Steinheil gives the results of his complete discussion of Dunér's spectroscopic determinations of the sun's rotation, extending over the period June 3, 1887–May 18, 1889.

Taking Dunér's spectroscopic values for different positions round the limb and the centre, these are reduced to heliographic coordinates by a table of declination corrections supplied to the author by M. Dunér, and so furnish over 600 equations of condition, which when grouped according to latitude are brought down to 22. Solving these by the method of least squares, the final result appears as

$$\begin{aligned}x &= 2\cdot054 \quad \pm 0\cdot0042\\ i &= +\ 18^\circ\cdot12 \pm 0\cdot25\\ \Omega &= +\ 28^\circ\cdot00 \pm 0\cdot50\end{aligned}$$

This means that the result of the new discussion of Dunér's spectroscopic observations is that the sun rotates so that a point on its equator moves with a uniform velocity of 2·054 kilometres per second round an axis the inclination of which towards the axis of the ecliptic is 18°·12, the longitude of the intersection of the sun's equator with the ecliptic being +28°·00.

The value of the velocity $x = 2\cdot054$ is not the true velocity, but the synodic; we get the true value by adding $2d \sin \omega$, where d is the velocity of the earth in its orbit in kilometres per second, and ω the semi-diameter of the sun, expressed in angular measures as seen from the earth.

THE POLARIS MULTIPLE STAR.—Prof. W. W. Campbell is reported to have stated in the *New York Times*:—

"The recent observations of Polaris at the Lick Observatory

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show that its velocity is variable. It is *approaching* the solar system now (September 12) with a velocity of 8 kilometres per second. This will increase in two days to 14 kilometres, and in the next two days will decrease to its former value of 8 kilometres. This cycle of changes is repeated every *four* days. . . . The orbit is nearly circular, and is comparable in size with the moon's orbit round the earth.

"This centre of gravity, and therefore the binary system, is approaching the solar system at present with a velocity of 11·5 kilometres per second. A few measures of the velocity of Polaris made here (Lick) in 1896 gave its velocity of approach at the rate of 20 kilometres per second. Part of this change since 1896 could be due to a change in position of the orbit of the binary system, but most of it must have been produced by the attraction of a *third* body on the two bodies comprising the '*four-day*' system."

A correspondent to the *Scientific American* (September 16) says that Mr. J. A. Brashear has just completed one of the pair of large astronomical camera doublets for the Observatory of the University of Heidelberg. They are next to the largest so far made, being 16 inches clear aperture and 80 inches focal length. Two of these doublets, each consisting of four lenses, are to be made, and are to be used almost exclusively for the photographic discovery of new asteroids. The reason for using two cameras is to provide a check on the possible inaccuracies inseparable from the use of photographic plates, such as false images, &c. The track of an asteroid with a lens of this focus on an 8 × 10 plate is only about one-twentieth of an inch long for an exposure of three hours. As the curves of the lenses have necessarily to be very deep, the casting of the great discs was found to be very troublesome. The fund for the equipment has been provided by Miss Catherine Bruce, of New York City, who was also the donor of the largest photographic doublet (24-inch aperture), to the Harvard College Observatory at Arequipa.

We learn from the *Evening Standard* that the expedition sent by the Vienna Academy of Science to India to observe the shower of meteoric Leonids during the night of November 14–15, or the following night, has started from Trieste. The leader of the expedition is Herr Director Weiss, of the Vienna Observatory, who is accompanied by Prof. von Hepperger, of the Gratz University, the astronomers, Dr. Hillebrand, Dr. Prey, Herr Rheder, and Dr. Mache. The Indian Government has promised to give the expedition, which will make its observations near Delhi, every possible assistance.

THE FREEDOM OF THE CITY OF MANCHESTER.

On Friday, October 6, the City of Manchester conferred her freedom on Enrigueta Augustina Rylands, Robert Dukinfield Darbishire, and Richard Copley Christie.

Mrs. Rylands.

Mrs. Rylands presented to the city the library, magnificent in its contents and beautiful in its fabric, which she built in memory of her husband, John Rylands, whose name it bears—John Rylands, who as "a Manchester merchant built up from the lowliest beginnings a business of unparalleled magnitude, and left behind him a name for industry that never hasted nor rested, and a probity that knew no shame."

Principal Fairbairn, in his inaugural address, drew a remarkable parallel between Alexandria, whose library was the richest in the world, and Manchester, "cities, whose princes were merchants and whose merchants princes," and, he added, "everything that raises a great provincial and industrial city to metropolitan rank makes for higher order, sweeter life and purer manners." The opening of this great library calls for national jubilation.

The noble fabric, designed by Mr. Basil Champneys, is in the fourteenth century Gothic style, and is possibly the finest building erected in England in this generation. The building is built entirely of Penrith limestone, the exterior being the dark red Barbary stone, and the interior delicately shaded Shawk stone.

The staircase which leads to the main library is surmounted with a beautiful octagonal lantern surrounded by a carved stone gallery. The library proper is set back ten feet from the line of the building in order to secure a sufficient supply of light, and is built on the collegiate plan in a long aisle ending in an apse, the total length being 148 feet.

The building is vaulted and groined throughout in stone, it is divided into eight bays occupied by bookcases, and contains a gallery in which this arrangement is repeated; two large rooms opening from the apse contain the collection of Bibles, and the maps. The whole building is elaborately finished with statues and carving, and the fittings are all in harmony with the general scheme of decoration.

Two beautiful traceried windows, by Mr. Charles Kempe, form a notable addition to the beauties of the building. The library contains the famous Althorp collection, and Mrs. Rylands' private collection, which contains Wycliffe MSS. and Wynkyn de Wordes; the library has been endowed, and will be kept up to date.

Mr. R. D. Darbishire and Mr. R. C. Christie.

When Sir Joseph Whitworth lay on his deathbed he attempted to complete a scheme for the utilisation of his property.

But he could not explain so vast an idea, and, throwing out his hands, exclaimed "I cannot do it now; I must leave it to you, who know what it means!"

And it was to Lady Whitworth, to Mr. Christie and to Mr. Darbishire that he left his great wealth.

Lady Whitworth has followed her husband; Manchester has created the two remaining co-legatees her honorary citizens in recognition of the admirable way they have carried out their trust.

In connection with this trust, the legatees presented the site of the Manchester Technical School, and contributed largely to the School of Art; made many valuable gifts of money to the Owens College for the engineering laboratory, the museum, the college hospital property, and for general purposes; and presented ten acres of valuable land as an athletic ground for the College; finally presented the Whitworth Hall, now in course of erection at a cost of 50,000*l.* Presented and partially endowed the Whitworth Park and Art Gallery; erected a public library and hall at Openshaw (where Sir J. Whitworth and Co.'s works are situated).

In addition to the great personal labours in the wise and generous application of the Whitworth estate, Mr. Christie rendered invaluable service to the College in the times of storm and stress. Mr. Christie occupied in 1854–5 the united Chairs of History, Political Economy, Law and Jurisprudence. He is president of many learned societies, and chairman of numerous public bodies, charities and trusts; he is president of the Cancer Home and Pavilion, an admirable institution which originated in his generosity.

His chief literary production is the masterly biography of Etienne Dolet, the second edition of which has just been published.

The magnificent new library at the Owens College which bears his name was his personal gift, and was erected at a cost of 21,000*l.*

The total sum which passed through the hands of the Whitworth Trustees was 1,250,000*l.*; of that sum, 250,000*l.* was spent in redeeming promises and obligations, and the legatees themselves are responsible for the distribution of 960,000*l.*

W. T. L.

VISIT OF THE INSTITUTION OF ELECTRICAL ENGINEERS TO SWITZERLAND, AUGUST 31 TO SEPTEMBER 8.

Conservative principles are no doubt of considerable service to England, but perhaps least so when applied to the problems of industry. It is a curious and possibly significant fact that as an electrical power England occupies a very insignificant position, and this in spite of the circumstance that the foundations of the industry were to a great extent laid by English engineers. Some years ago a very authoritative statement was made that in so far as ships of war are concerned our best policy is to watch the experiments of foreign nations and to profit by them, rather than make experiments for ourselves; and it is not uncommon to hear similar remarks with regard to the industrial use of electrical appliances. Unhappily we seem to have forgotten the immense advantages which have accrued to us from our pioneering of the railway industry. No doubt in the early days many mistakes were made and much

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